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# Divine Punishment or Object of Research? The Resonance of Earthquakes, Floods, Epidemics and Famine in the Correspondence Network of Albrecht von Haller<sup>1</sup>

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## ABSTRACT

The Enlightenment is a starting point for our current understanding of natural disasters. The present investigation examines the resonance of such catastrophes in the correspondence network of the universal scholar Albrecht von Haller (1708–77). In this European system of communication there is a very rapid exchange of widely dispersed individual observations and an intensive discussion about competing interpretations. Poetic, philosophical, scientific and administrative approaches overlap rather than contradict one another. A main topic is the earthquake of Lisbon 1755, with the important role of Voltaire, who embodied the Enlightenment like no other and who was the greatest ideological antipode of Haller. Although earthquakes are the main focus of attention, some comparison is made with letters discussing cattle diseases, plagues, famines and floods.

## KEYWORDS

Natural disasters, earthquakes, correspondence networks, Albrecht von Haller

When, in the universe, forces shake the planets from their spheres,  
And Nature, confused, leaves her ancient course <sup>2</sup>

Johann Georg Zimmermann, *Die Zerstörung von Lissabon* (Zurich 1756)

Today earthquakes are indisputably classed as natural disasters as are floods and severe storms. Epidemics, cattle disease and famines are clearly not so classified because they can usually be attributed to some social, political or economic cause. In the early modern period, however, all such catastrophes were understood as belonging to a common complex. In the ecclesiastical–authoritarian interpretation, they were sent by a wrathful God to punish human transgressions (retribution theology), while in more popular belief, based on an ancient magical interpretation of nature, they were omens of disaster. By contrast, in the Age of Enlightenment a new scientific–technological approach to such catastrophes became increasingly important. Attempts were made to rationalise them as subjects of scientific research, to bring them directly under human control and, by taking suitable precautions, to prevent them or, at least, to weaken their effects.<sup>3</sup> The Enlightenment is therefore a decisive starting point for our current understanding of natural disasters. This is the reference point of the present investigation, which examines the resonance of competing interpretations of natural disasters in a European system of communication. Although earthquakes are the main focus of attention, some comparison is made with letters discussing other divine punishments in order to gain an overall view of what are now seen as separate events, but which were historically viewed as one phenomenon:

It is Almighty God, who destroys whole empires with earthquakes, who commands the seas to flood the land, drowning thousands of mortal souls in a moment, who sends infectious diseases from which a third of the population may perish... it is not by chance or so-called laws of nature but by the will of God, who, in his infinite wisdom, directly punishes his people that they may know their one true king.<sup>4</sup>

In a series of sermons on the righteousness of the Almighty, the universal scholar Albrecht von Haller thus interprets earthquakes, floods and pestilence in the spirit of retribution theology. As the founder of experimental physiology, pioneer of botanical geography and reformer of the German language (with his famous poem ‘Die Alpen’), Haller is one of the major figures in the century of the European Enlightenment. Nevertheless, he is also a passionate defender of the old beliefs against the Enlightenment tendency towards freethinking and religious tolerance. Haller’s ‘Letters on the Rejection of the Revelation by some Free-thinkers Still Alive Today’ (‘Briefe über einige Einwürfe nochlebender Freygeister wider die Offenbarung’), from which the cited passage is taken, are directed explicitly against Voltaire, a writer and philosopher who embodied the Enlightenment like no other. And it is this man of the century, Voltaire, who

plays an important role in the resonance of earthquakes in Haller's correspondence. This celebrity and the ambivalence of Haller himself make the subject pursued here particularly intriguing.

#### THE LISBON EARTHQUAKE AS A EUROPEAN EVENT

On 15 December 1755, Johann Georg Zimmermann, a physician in the town of Brugg, writes to Haller in Bern:

I cannot think of this terrible catastrophe without horror. And you, as a man of extraordinary sensitivity, the greatest poet of our times, what is your impression? How do you interpret this latest news, and what thoughts do they inspire? Please do me the favour of letting me know about the best works that have been written on the subject of earthquakes.<sup>5</sup>

The catastrophe referred to here is the huge earthquake, which struck Lisbon on 1 November 1755 (Figures 1 and 2).<sup>6</sup> Zimmermann's catalogue of questions as to how this event should be interpreted is of exemplary importance. He appeals



FIGURE 1. 'Plan of the former city of Lisbon'. The numerous ships represent the intensive trading activity of the city, on which its prosperity depended (from Anonymous 1756).



FIGURE 2. 'Representation of the Lisbon Earthquake'. The powerful quakes were accompanied by a tidal wave from the ocean and numerous fires, which started from fires in the hearths of the ruined buildings (from Anonymous 1756).

to Haller as sensitive poet, thinking philosopher and natural scientist, formulating precisely the three dimensions in which a discussion of earthquakes triggered by the Lisbon disaster will take place. It also reveals how, in the person of Haller, the poetic, philosophical and scientific aspects overlap rather than contradict one another. The extent of this multi-dimensional yearning for meaning is indicated by, line 6 of text the extent of cross-border attention to the earthquake, featuring the Lisbon earthquake as a European media event (Map 1).<sup>7</sup> There were different reasons why it became a catastrophe on a European scale, unlike earlier localised earthquakes. The strength of the quake was exceptional and in the densely populated city of Lisbon thousands of people perished. Moreover, the Lisbon earthquake was actually the climax of a whole series of seismic tremors between 1755 and 1756. On the day of the Lisbon disaster itself, distant effects were observed in large parts of Europe, and in the months that followed, weaker and sometimes multiple earthquakes were felt in the most widely spread regions of Europe. The ability to perceive this on a macroseismic level is dependent on the dense network of inter-regional communication links typical of the Age of Enlightenment in a combination of written media: books, journals, newspapers and letters.



MAP 1. The Lisbon earthquake as a European event: publications 1755–1757. Places of publication ( $n=51$ ) weighted by amount of publications ( $n=107$ ).

### EARTHQUAKE OBSERVATIONS 1755/6

Haller's correspondence<sup>8</sup> contains 47 letters on the subject of earthquakes (Map 2). More than half of these were written in the first year after the Lisbon earthquake. The first specific news comes from the physician Samuel Friedrich Neuhaus who reports from Biel on 4 December 1755 that on the day of the Lisbon earthquake the spring water in his city seemed extremely cloudy despite the fine weather.<sup>9</sup> This observation is included in 'Earthquake News from Switzerland',



MAP 2. The resonance of earthquakes in the correspondence network of Albrecht von Haller. Places of senders and addresses ( $n=23$ ) weighted by amount of letters ( $n=47$ ).

published by Haller in the *Göttingische Gelehrte Anzeigen* on 6 March 1756.<sup>10</sup> In the same journal on 12 January 1756, Haller is already writing about the report submitted by a learned subscriber, who, whilst travelling in the region of Lucerne a few days after the Lisbon earthquake, had been told how, on 1 November, the day of the Lisbon earthquake, the waters of the lake had been ‘uncommonly high and rough, placing ships in peril of shipwreck’.<sup>11</sup> Haller was probably given this account by word of mouth, for no corresponding letter has ever been found. Otherwise there are very few reports in the Haller network on distant effects of

the Lisbon earthquake on the day of the catastrophe itself. There are, however, frequent accounts of earthquakes in the months that followed. Typical of these is the letter from Philipp Friedrich Gmelin, professor of medicine in Tübingen, who describes a tremor on 7 January 1756; nothing was detected in his city on 1 November 1755, however.<sup>12</sup> In letters exchanged with doctors and natural scientists – Charles Bonnet in Geneva, Abraham Gagnebin in La Ferrière, Johannes Gessner in Zurich, Bernard Jean François Ricou in Bex and the aforementioned Zimmermann in Brugg – several quakes are perceptible on Swiss soil (9 December 1755 and 2 January 1756, among others).<sup>13</sup> These reports describe them as powerful enough to break crockery in the Jura, cause chimneys to collapse in Bern, cracks to appear in church roofs in Lucerne, the church bells to sway in Geneva and crevices to appear in the ground in the Wallis. The earthquake is experienced underfoot, making the remote Lisbon event a main topic throughout Europe. In Bern, for example, Haller's sister-in-law Katharina Müller-Wyss describes great excitement at the beginning of January 1756 after an old man prophesied that the city and five other towns would be totally destroyed in the next few months.<sup>14</sup> From Geneva, Bonnet writes in February 1756 that, since the terrible disaster in Lisbon, earthquakes are still the only topic of conversation here and everywhere else.<sup>15</sup>

#### EARTHQUAKE OBSERVATIONS 1774

A second series of earthquake observations occurs almost two decades later. On 23 April 1774 Johann Heinrich Koch, an apothecary from Thun, writes with great consternation after the terrible earthquake 'which struck the capital city on Monday morning at half past one'.<sup>16</sup> The earthquake in question is the tremor that shook Bern during the night of 17/18 April 1774. Haller notifies his friend Bonnet of this event on 24 April. Although it had only limited effect (nothing was felt in Echallens, Murten, Thun or Zofingen), the tremor felt in 1755 was only a slight shudder by comparison.<sup>17</sup> On 28 April, Haller writes to John Strange Jr., an English naturalist and diplomat in Lyon, that a salesman who had also lived through the Lisbon earthquake judged the Bernese quake to be of similar strength but shorter duration and with fewer long tremors. No great damage occurred in Bern simply because the city was built on a firmer foundation (sandstone).<sup>18</sup> Strange replies from Lyon on 1 May that Haller's earthquake report has been forwarded to the physician and naturalist John Pringle in London.<sup>19</sup> A further tremor is reported by Haller to the privy councillor in the duchy of Württemberg, Eberhard Friedrich von Gemmingen in Stuttgart, to the physician Samuel Auguste Tissot in Lausanne and to Bonnet in Geneva. It was felt in large parts of Switzerland on 10 September 1774, but in Haller's perception it was not as powerful as the tremor in April of the same year.<sup>20</sup>



## THE LIMITS OF SCIENTIFIC EXPLANATION OF EARTHQUAKES

The individual seismic observations in the letters are often interlaced with fragments of scientific theories about earthquakes. The most prominent feature in the Haller correspondence on the subject is great scepticism, 'the knowledge, that nothing is really known'. Georg Matthias Bose, Professor of Physics in Wittenberg, doubts whether research into earthquakes will ever bring forth the truth.<sup>21</sup> And Haller comments to Bonnet in 1756, 'I very much fear, that we shall never find a rational explanation of earthquakes';<sup>22</sup> and in 1774, 'I haven't the slightest idea how earthquakes are caused'.<sup>23</sup> Vague theories based on underground caverns and explosions, ultimately attributable to Aristotle, continued to dominate in the eighteenth century.<sup>24</sup> The extent to which they were held suspect by naturalists is shown in some of the letters. Bonnet, for instance, formulates the explosion theory only as a question<sup>25</sup> and, during the powerful Bernese quake of 1774, Haller suggests the cavern theory, but only to relativise it in the same breath:

It was one of those nights when I was unable to sleep. The dreadful noise reminded me of a building collapsing, its stones crashing against the paving below. The earthquake was very powerful, and I could not rise ... I cannot push from my mind the image of a subterranean cavern collapsing in on itself.<sup>26</sup>

Similar vague theories of subterranean caverns and explosive materials were also the starting point for precautionary measures suggested in 1756 by Göttingen professor of philosophy, Samuel Christian Hollmann, to prevent further earthquakes. His idea was to bore thin vertical shafts down to the underground caverns to draw off any explosive vapours. However, it found little favour, also in the Haller correspondence. The opinion of Carl Gottlob Springsfeld, a physician in the city of Weissenfeld, is particularly negative in a letter to Haller.<sup>27</sup> Signs of a new understanding, linking earthquakes and electricity, are evident in a letter of 15 September 1774 from Neuenburg clergyman, Jean Jacques Roy.<sup>28</sup> Although it is somewhat confused, Haller still considers this observation of 10 September worth reporting.<sup>29</sup>

Letters from the Paris physician François Thierry are concerned with the consequences of earthquakes rather than a scientific explanation of their causes. In 1756 he is already talking about symptoms of nervous diseases, which he attributes to the earthquake.<sup>30</sup> During the powerful Bernese quake of 1774, he describes his theory to Haller. He believes that more frequent tremors since 1755 have released huge changes in the atmosphere, which affect the human body and spirit. He asks whether the causes of the visible acceleration in social and cultural changes may not be found in earthquakes.<sup>31</sup> That a doctor well versed in scientific discourse (Thierry writes about 150 letters in total to Haller) can put forward such a speculative link between nature and society is again indicative of the state of contemporary knowledge of earthquakes. The scepticism expressed by Haller,

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Bonnet and Bose is not without foundation. The evident lack of a (natural) scientific interpretation of earthquakes stands in twofold contrast in Haller's correspondence: firstly, to the intensive and very quick international exchange of individual seismic observations described above and, secondly, to artistic interpretation.

## DISPUTES SURROUNDING THE ARTISTIC INTERPRETATION OF EARTHQUAKES

Hot on the heels of the primary phenomenon itself, the Lisbon earthquake finds artistic expression in the Haller correspondence network in the form of two poems by Zimmermann and Voltaire. On 1 December 1755, Zimmermann begins with his poem about the destruction of Lisbon, written when he can only have known the news for a few days.<sup>32</sup> His first draft of approximately 70 non-rhyming alexandrines is sent to Haller for his opinion on 3 December.<sup>33</sup> On 15 December he again asks Haller for his critical judgement and notifies him of stylistic changes to the metre of the verse.<sup>34</sup> On 27 December, Zimmermann is annoyed because a draft version of his poem has already been published without his permission.<sup>35</sup> In the same letter, he tells Haller about another poem he is currently writing. It appears in Zurich in January 1756 as 'Gedanken bei dem Erdbeben das den 9. Christmonat 1755 in der Schweiz verspühret worden'. In the summer of 1756 he again submits a heavily revised version of the Lisbon poem to Haller for his opinion. Although Haller finds a few polite words for individual verses, he also warns Zimmermann of the intolerance shown in Switzerland towards physicians who dabble in poetry.<sup>36</sup> In the review in the *Göttingischen Gelehrten Anzeigen*, Haller is brief, which is his way of showing that he does not consider a work to be of any significance.<sup>37</sup> Zimmermann's poem is not credited with any artistic merit today, but it is considered of historical importance because of its theological–philosophical content. It is a subjective expression of an individual process of pietistic awakening. Extreme shock releases a psychological examination of conscience, a sense of humility and remorse, repentance and ultimately an acceptance of grace.<sup>38</sup>

Voltaire's 'Poème sur le désastre de Lisbonne, ou examen de cet axiome: tout est bien' is a completely different format.<sup>39</sup> It towers above all other poetic writings on the Lisbon catastrophe both in its language and philosophical content, and its publication sent 'a shiver through the European intellectual community'.<sup>40</sup> Voltaire makes one of the first references to the Lisbon earthquake on 28 November 1755, to Elie Bertrand. Bertrand, a clergyman at the French church in Bern, and later the author of several sermons and two Christian texts based on the earthquake, is a confidant both of Voltaire and Haller. From his residence, 'Les Délices' near Geneva, Voltaire puts the rhetorical question to Bertrand: 'Would Pope have dared to say that whatever is, is best if he himself

had been in Lisbon?’<sup>41</sup> And a few days later he expresses himself even more clearly to Bertrand: ‘This is a terrible argument against optimism.’<sup>42</sup> Right at the start, therefore, Voltaire reflects the earthquake disaster in the theological-philosophical mind-set of his later poem. It stands in contrast to the optimistic thesis of Pope and Leibniz, according to which all is well in the world, and examines the much discussed problem of theodicy: namely, how to explain the evil of this world when, if God is considered a perfect being, his very attributes should preclude the wilful creation of evil and suffering.<sup>43</sup> Voltaire has completed the first version of his poem by 4 December; a few days later various poems about Lisbon were circulating in Paris and were falsely attributed to Voltaire.<sup>44</sup> At about the same time, Voltaire begins to hold readings of draft versions of his poems in the small district of Montriond in Lausanne. A friend of Haller, the exiled former governor (‘Landvogt’) of Bern, Beat Ludwig May, receives from an acquaintance part of the final section. On 2 January 1756, he sends it to Haller, including this key section:

What does it all mean? Oh, ye mortals, it is your destiny to suffer, to submit in silence, to pray and to die.<sup>45</sup>

May is obviously worried by Voltaire’s ‘materialistic’ and ‘pessimistic’ thoughts and tries to counter them. He takes Haller’s poem ‘On the Origin of Evil’ (‘Über den Ursprung des Übels’), which deals with the problem of theodicy from a standpoint of much firmer religious conviction, translates parts of it freely into French, and sends it to Voltaire. In the above-mentioned letter to Haller, May cites from his translation a statement of boundless trust in God and the perfection of his creation justified by an understanding of the purposefulness of nature.<sup>46</sup>

Bertrand also had access to draft versions of the Lisbon poem. Like May, he criticises its overly pessimistic conclusion. Consequently, in a letter to Bertrand of February 1756, Voltaire promises changes. For example, he intends to lighten the final passage by adding the word ‘hope’.<sup>47</sup> It is not that easy, however. On 27 March 1756, Gabriel Seigneux de Correvon, a magistrate in Lausanne, tells Haller about a private reading given by Voltaire on 15 March. He states that, though Voltaire read his Lisbon poem very well and fluently, no one else could have read it because the manuscript was a patchwork of alterations, additions, and deletions.<sup>48</sup> In the new final sequence, which Seigneux de Correvon sends to Haller, the verses with which May and Bertrand found so much fault, (‘What does it all mean? Oh, ye mortals...’) have been replaced by a new, longer passage. One of the closing lines now runs as follows: “‘In the future all will be well” is a hope. “Today whatever is, is best” is an illusion.’<sup>49</sup>

The verses appeared in this form in May 1756. However, Voltaire gives the note of hope that all will be well in future a twist of scepticism by adding in his own handwriting the following amendment: “‘All will be well”, what a *feeble* hope is that!’<sup>50</sup> In this revision of the revision, Voltaire’s conflicting goal is

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evident: to present a critical approach to optimism in his poem about the destruction of Lisbon whilst offering as few targets as possible to the faithful. The same effort is manifest in the discussion Voltaire has with Lausanne professor of theology, Jean-Alphonse Rosset de Rochefort, and Seigneux de Correvon after the above poetry reading, and reported by the latter to Haller. Voltaire's poem does not in any way question Pope's famous axiom, but merely its misuse. He also considers Christianity the only way towards truth and peace of mind. And the enthusiastic Seigneux de Correvon continues:

I shall not try to impart to you all the beautiful things he has said to us in praise of Christianity; he combines it with a passion that cannot help but convince ...<sup>51</sup>

At the very least, the general hymn of praise to Christianity is probably tactically motivated.<sup>52</sup> Voltaire is a person of European stature, held permanently under suspicion of freethinking and atheism, and, since recently, resident in the state of Bern. He must assume that his pronouncements will attract close attention, even by Haller. However, Voltaire's efforts do not seem to have succeeded with the latter, judging by the crushing criticism of the Lisbon poem in letters exchanged between Haller and Bonnet. Haller denounces Voltaire's distress at the high numbers of the dead in Lisbon as non-philosophical, for 'all these Portuguese had to die; does he begrudge GOD, their creator, the privilege of deciding whether death should come sooner or later?'<sup>53</sup> Bonnet even denies Voltaire any philosophical competence: 'But this is what Mr. Voltaire is like; he always wants to play the philosopher, but he nearly always plays the role badly.'<sup>54</sup> When in 1759 Voltaire publishes *Candide*, another work that deals with the Lisbon catastrophe in a manner strongly critical of the tendency to optimism, he finally becomes for Bonnet a lost non-believer, who abuses his great gift of eloquence:

In my opinion, he is one of the unhappiest souls on earth. He would be so owing to his sad lack of belief alone; a man for whom, judging by the universe he reveals in his Lisbon poem and in *Candide*, the whole of nature is dressed in black. However, I cannot forgive him for portraying it in this way.<sup>55</sup>

In retrospect, Haller describes the Lisbon poem as the decisive moment when he finally recognises Voltaire's interpretation of nature.<sup>56</sup> From then on, Haller would regard him as his biggest ideological adversary.

## THE RESONANCE OF CATTLE DISEASE, FAMINE AND PLAGUE

Discussions of the earthquake should now be put into perspective against the resonance of other divine punishments. On the subject of cattle disease, famines and plague there is also an intensive cross-regional exchange of individual

observations. And, as with earthquakes, they can be interpreted as parts of a higher phenomenon, especially as most of the contributors are also educated naturalists. Between 1767 and 1777 Haller exchanged about 50 letters with a total of twenty correspondents in seven (modern) countries on the subject of cattle disease, and, by a process of collecting and comparing, he made considerable progress in the understanding of the causes and symptoms of the disease.<sup>57</sup> With respect to the European famine of 1770–1772 Haller exchanged more than 70 letters. From these he gained a regional comparison and a continuously updated picture, for example of local increases in corn prices throughout Europe.<sup>58</sup> During the great plague of 1771/2, which started in Eastern Europe, Haller was able to bypass the officially censored channels of information by obtaining details about the actual spread of the disease through his direct line of communication, e.g. from Vienna, Breslau, Berlin and Lübeck.<sup>59</sup> This international communication network led not only to a new scientific understanding of the catastrophe, but also to the development and exchange of countermeasures within the Haller network. Official measures employed during the plague in Prussia, Hamburg, Lübeck, Russia and by the Habsburg monarchy were discussed; during the famine, indispensable purchases of grain were organised from abroad to avoid the catastrophe; causes of the grain shortage were sought and precautions suggested, including a system of official grain storehouses, improved grain storage techniques and attempts to grow newly introduced high-yield agricultural plants such as potatoes. The medical treatments employed during the outbreak of cattle disease were criticised, and the catastrophic spread of the disease in Holland and France was counteracted by the successful Bernese cattle disease policing strategy (accurate diagnosis, import controls, elimination of infected animals, financial compensation). The contemporary context, in which these threatening catastrophes are also dealt with scientifically and implementally in the Haller network, is illustrated by an example outside the enlightened communication system. Following the logic of retribution theology, the City Council of Hildesheim in 1756 ordered extraordinary prayers and hymns to thank God for his mercy and beg for his continued gracious protection against pernicious cattle diseases and terrible earthquakes (the Lisbon earthquake had happened only three months before).<sup>60</sup>

#### ON THE RESONANCE OF FLOODS AND SEVERE STORMS

Floods receive little mention in the Haller network. Only ten letters have been found on this topic, another six if the related category of severe storms is included. All but two of these letters date from the period between 1760 and 1765

and originate geographically from Bern, the Vaud and Geneva. Most contain only a brief reference to the damage caused, as in the example of a violent storm-force wind in the spring of 1760, which destroyed the newly erected salt-grading works in Roche.<sup>61</sup> Similarly, in the autumn of 1762 Haller writes to Bonnet in Geneva that he has received news from all over the alpine region including the Grisons, Schwyz, Glarus, Uri and the Haslital about devastation caused by floods.<sup>62</sup> Finally, severe storms and floods at the end of August 1764 in western Switzerland make Haller's official route between Roche and Aigle impassable, and Tissot is forced to turn back when he attempts the journey from Lausanne to Roche to visit Haller.<sup>63</sup> Only in individual cases are community responses discussed. During extensive flooding of the Aare in February 1762, Haller hears complaints about the heavy burden faced by the affected communities of Münsigen, Hunziken und Belp, not least attributable to the compulsory provision of flood defences. Moreover, as Haller's correspondent reported, these communities lacked the necessary theoretical and practical knowledge to build proper flood defences.<sup>64</sup> Similar questions relating to improvements to protective measures (dikes, embankments, etc.) are broached anew during the floods near Roche in the autumn of 1765. Also expressed are the demands of the local population for wood for rebuilding work. The damage to the salt-works is also mentioned, as are irregularities in salt administration as a result of this violent natural event.<sup>65</sup> Finally, the only international discussion on this subject is also worthy of report. It takes place in an exchange of letters with privy councillor Eberhard Friedrich von Gemmingen in Stuttgart. Its subjects are a powerful storm-force wind 1776 in Holland, the tremendous damage caused to the dikes and injuries to people and animals, and the difficulties and problems experienced in arranging storm insurance in Württemberg.<sup>66</sup> Floods are a theme in the letters not only in their actuality but also in their biblical context. On various occasions, Haller discusses with his friend Charles Bonnet issues relating to the historical context of the biblical deluge<sup>67</sup> and, in a powerfully eloquent passage, Haller places this original catastrophe in the biblical-chronological scheme of divine salvation.

HE, who calculated the duration of the world, who sent the Flood in 1656 yet took pity on the earth, who in 4000 united divine nature in the purest man, knows what is needed in 6000, and what will be needed in one million years to remind man to honour HIM. Great disaster, a few enlightened persons, and a thousand other means are available to HIM. The V[oltaires] and R[ousseaus], the philosophers of our time, are nothing but children blowing against a mighty storm.<sup>68</sup>

So the discussion of earthquakes has come full circle, with another cutting remark against Voltaire.

## CONCLUSION

1. In the Haller network there is a very rapid and intensive international exchange of widely dispersed individual observations on earthquakes, cattle disease, plague and famine. When collected and compared, these individual events are clearly recognised as part of a higher phenomenon, which in turn becomes more precisely identified through local experiences. This is not the case for floods, where there is neither a systematic exchange of observations nor the first signs of a scientific breakthrough, probably because their effects are still too localised.<sup>69</sup>

2. Communication throughout Europe about cattle disease, plague and famine led to new and successful strategies for combating such catastrophes. The Haller correspondence contains substantial information about these measures, which involved scientifically legitimised political and administrative actions (epidemic policing, grain policy, etc.) rather than direct scientific countermeasures. Medicaments and vaccinations to treat cattle disease and epidemics were still far in advance of the state of contemporary research.

3. There is no evidence of serious efforts to find effective means for dealing with earthquakes, however. The scientific–technological potential of the time was inadequate for the prediction and prevention of earthquakes. However, earthquakes dominate in the Haller network in a way that other catastrophes do not: namely in the stylistic refinement of verse metre, discussions about the right word to use, outrage against a ‘materialistic’ conclusion. In short, they give rise to artistic interpretation with considerable theological–philosophical implications.

4. The resonance of these five catastrophes can be more accurately positioned along the axis running from ‘divine punishment to subject of research’. Cattle disease, plague and famine clearly appear as subjects of research, discussed exclusively within a scientific–technological context. Floods only feature very rarely as catastrophes, and the main interest remains in their biblical context rather than as a contemporary reality. The biblical Flood is discussed both as a subject of research and as a divine punishment. Earthquakes occupy a similarly ambiguous position, for although they are seen as a natural, scientific event, they are interpreted as divine punishment. This religious–penitent approach is apparent not so much in theological discussion as in the analyses of the artistic interpretations of the catastrophic earthquake in Lisbon. Could it be that art here is filling the void created as the interpretation of earthquakes as divine punishment is beginning to waver, but science has, as yet, no answers to give?

## NOTES

<sup>1</sup> The Albrecht von Haller research project ([www.haller.unibe.ch](http://www.haller.unibe.ch)) under the leadership of Prof. Urs Boschung is a joint project of the Institute of Medical History at the University of Bern and the 'Burgerbibliothek der Burgergemeinde Bern' (Director, J. Harald Wäber, Dr. Barbara Braun-Bucher). With the support of the Swiss National Foundation and the 'Albrecht von Haller-Stiftung der Burgergemeinde Bern', it reveals and researches the papers and works of Albrecht von Haller (1708–1777). The present essay first appeared in German (Stuber 2002). I wish to thank Monika Gisler (Swiss Seismological Service ETH Zurich) for critical remarks to this first version of the paper. The translation from German to English has been carefully undertaken by Mrs. Margot Kühnel Stringer (Peterborough, England). Most of the information is drawn from the Haller database (cf. Stuber 1999), compiled jointly by the author, Stefan Hächler (Bern) and Dr. Hubert Steinke (Bern/Oxford). The maps were produced by Richard Stuber (Bern). Unless specified otherwise, the letters cited in the original may be found in the 'Burgerbibliothek Bern. N Albrecht von Haller, Korr.'

<sup>2</sup> 'Wann in des Alles Raum der Welten Kräfte wanken,  
Und die Natur verwirrt die alte Bahn verlässt ...'

<sup>3</sup> Vocelka 1993, 297; Wiedemann 1993; Schmidt 1995, 4–5; 57; Kempe 1996; Ryter 1999, 12–13, 53; Zedinger 2000.

<sup>4</sup> Haller 1775, 95–6: 'Gott, der durch Erdbeben ganze Reiche umstürzt, der das Meer sich über die bewohnten Gegenden ausbreiten, und tausende von Sterblichen in einem Augenblick bedecken lässt, der den ansteckenden Seuchen befiehlt, den Drittel eines Volkes hinzuraffen, eben der allweise, der gerechte Gott ... es war seiner Weisheit gemäss, dass sein unmittelbar durch ihn beherrschtes Volk wissen müsste, kein Zufall, keine sogenannte Gesetze der Natur, sondern einzig der Befehl ihres wahren Königes, wäre die Ursache ihrer Bestrafung.'

<sup>5</sup> Johann Georg Zimmermann (1728–1795) to Haller, 15.12.1755: 'Je ne puis penser sans effroi à cette terrible catastrophe, vous qui avés le coeur si tendre, vous qui êtes le plus grand poete de nos jours, quelle impression cela vous a-t-il fait? quelles sont en gros les idées que cette nouvelle vous a fait naître, les reflexions qu'elle vous a fait faire? Faites-moi le plaisir Monsieur de me dire ce qu'on a écrit de mieux sur les tremblements de terre?' (Ischer 1903–1911, 203 [1906]).

<sup>6</sup> For general information cf. Breidert 1994; Briese 1998; Günther 1994; Kendrick 1956; Keller 1998; Kühlmann 1998; Löffler 1999; Lüsebrink 1999; Oeser 2000; Schmidt 1999; Wilke 1996.

<sup>7</sup> This (pragmatic) survey does not in any way claim to be complete. Details in the cited secondary literature and in the electronically available library catalogues were taken into account (Switzerland, Germany, Austria, France, Spain, United Kingdom).

<sup>8</sup> About 13,300 letters to and 3,700 letters from Haller have been handed down, exchanged over a period of more than half a century with almost 50 female and 1,150 male correspondents in about 450 towns between Stockholm, Moscow, Malaga and Dublin. During this period, Haller himself was resident in Bern (1729–36), Göttingen (1736–53), Bern (1753–58), Roche (1758–64) and again in Bern (1764–77). Cf. Boschung et al. 2002 (for an overview in English: Stuber, Steinke and Haechler 2002).

<sup>9</sup> Samuel Friedrich Neuhaus (1733–1802) to Haller, 4.12.1755.

<sup>10</sup> *Göttingische Gelehrte Anzeigen* 6.3.1756 (234).



<sup>11</sup> *Göttingische Gelehrte Anzeigen* 12.1.1756 (44): '[der See] ungemein sich erhoben, getobt, und die Schiffe zu Gefahr des Schiffbruchs gesetzt habe.'

<sup>12</sup> Philipp Friedrich Gmelin (1721–1768) to Haller, 15.1.1756.

<sup>13</sup> Charles Bonnet (1720–1793) to Haller, 4.2.1756 (Sonntag 1983, 78); 22.10.1774 (*ibid.*, 1142); Abraham Gagnebin (1707–1800) to Haller, 24.12.1755; Haller to Johannes Gessner (1709–1790), 12.12.1755 (Sigerist 1923, 245); Bernard Jean François Ricou (1730–1798) to Haller, 2.1.1756; 6.2.1756; Zimmermann to Haller, 15.12.1755 (Ischer 1903–1911, 203 (1906)); 27.12.1755 (*ibid.*, 204).

<sup>14</sup> Katharina Müller-Wyss (1720–1809) to Haller, 9.1.1756.

<sup>15</sup> Bonnet to Haller, 4.2.1756 (Sonntag 1983, 78).

<sup>16</sup> Johann Heinrich Koch (1706–1787) to Haller, 23.4.1774: '[das Erdbeben] das sich abgewichenen Montag morgens umb halb 1 uhr in der Hauptstadt geüssert.'

<sup>17</sup> Haller to Bonnet, 24.4.1774 (Sonntag 1983, 1118); cf. Bonnet to Haller, 17.5.1774 (Sonntag 1983, 1119).

<sup>18</sup> Haller to John Strange jr. (1732–1799), 28.4.1774 (Royal Society London).

<sup>19</sup> Strange to Haller, 1.5.1774; John Pringle (1707–1782).

<sup>20</sup> Haller to Bonnet, 16.9.1774 (Sonntag 1983, 1140) 'Le tremblement de terre du 10 a été moins fort que celui du 17 d'avril. Il a cependant été sensible et très long: la terre a oscillé longtemps après avoir tremblé; je l'ai très bien remarqué. Vers le N.E. on l'a aperçu par toute la Suisse, à Schaffhouse même. Il n'y a eu cependant aucun mal de fait.'; Bonnet to Haller, 22.10.1774 (*ibid.*, 1142); Haller to Samuel-Auguste Tissot (1728–1797), 11.9.1774 (Hintzsche 1977, 398): 'Il y eut hier après dîner un violent tremblement de terre, moins fort cependant que celui du 17 avril'; Haller to Eberhard Friedrich von Gemmingen (1726–1791), 22.10.1774 (Fischer 1899/1979, 76): 'Man hat nicht vernommen, dass irgendwo ein Berg eingestürzt oder einiger beträchtlicher Schaden durch das Erdbeben des 10. geschehen seye. Es war auch gar viel schwächer als das wahrhaftige fürchterliche vom 17. April. Was von Altdorf (Uri) geschrieben worden ist, scheint vergrößert'; von Gemmingen to Haller, 10.10.1774 (*ibid.*, 75).

<sup>21</sup> Georg Matthias Bose (1710–1761) to Haller, 29.4.1756.

<sup>22</sup> Haller to Bonnet, 8.4.1756: 'J'ai bien peur qu'on ne parvienne jamais à une explication raisonnable des tremblements de terre.' (Sonntag 1983, 82).

<sup>23</sup> Haller to Bonnet, 30.10.1774: 'Je n'ai aucune idée de la cause des tremblements.' (Sonntag 1983, 1143).

<sup>24</sup> Cf. Adams 1938/1954, 399–425; Briese 1998, 134–6; Keller 1998, 135–6; Holländer 2000.

<sup>25</sup> Bonnet to Haller, 22.10.1774: 'Ne pensés-vous pas, que l'Eau reduite en vapeurs est le principal agent dans ces redoutables phénomènes? Les Pays de Montagnes doivent y être plus sujets, à cause des Pyrites & autres Matières inflammables qu'elles recèlent dans leur sein. Nous sommes bien ignorans sur l'intérieur de notre Globe, & je ne pense pas que nous le connoissions jamais un peu: car que sont nos plus profondes Mines relativement au Rayon?' (Sonntag 1983, 1142).

<sup>26</sup> Haller to Bonnet, 24.4.1774: 'C'etoit une de ces nuits, que je passe sans voir le sommeil. Le bruit horrible me rappela celui d'un edifice qui crouleroit, dont les pierres fraperoient contre un pavé. Le tremblement fut très violent; je n'aurais pas pu me lever sur pié ... Je ne pus me refuser à l'idée d'une voute souterraine qui auroit ecroulé.' (Sonntag 1983, 1118).

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- <sup>27</sup> Carl Gottlob Springsfeld (1714–1772) to Haller, 2.4.1756; Samuel Christian Hollmann (1696–1787); cf. Briese 1998, 144f.; Ulrich 1933, 123–6.
- <sup>28</sup> Jean Jacques Roy (1720–1787) to Haller, 15.9.1774.
- <sup>29</sup> Haller to Bonnet, 30.10.1774 (Sonntag 1983, 1143).
- <sup>30</sup> François Thierry (1719–1793) to Haller, 11.5.1756.
- <sup>31</sup> Thierry to Haller, 16.5.1774.
- <sup>32</sup> Rector 1998, 86.
- <sup>33</sup> Zimmermann to Haller, 3.12.1755 (Ischer 1903–1911, 198 [1906]).
- <sup>34</sup> Zimmermann to Haller, 15.12.1755 (ibid., 202).
- <sup>35</sup> Zimmermann to Haller, 27.12.1755 (ibid., 204). According to Rector 1998, 86 published in Schaffhausen, with reprints shortly afterwards in Zurich and Potsdam.
- <sup>36</sup> Haller to Zimmermann, 29.7.1756 (Bodemann 1885, 46/47); 6.8.1756 (ibid., 47/48).
- <sup>37</sup> *Göttingische Gelehrte Anzeigen* 20.11.1756 (1271).
- <sup>38</sup> Rector 1998, 92.
- <sup>39</sup> In: Breidert 1994, 58–73.
- <sup>40</sup> Löffler 1999, 64; Breidert 1994, 57.
- <sup>41</sup> Voltaire to Elie Bertrand (1713–1797), 28.11.1755: ‘Si Pope avait été à Lisbonne, aurait-il osé dire, tout est bien?’ (Besterman 1957–1958, XXVIII, 169); cf. Wirz 1982.
- <sup>42</sup> Voltaire to Bertrand, 30.11.1755: ‘Voilà un terrible argument contre l’optimisme. (Besterman 1957–1958, XXVIII, 171).
- <sup>43</sup> Lorenz 1995, 405. Universal scholar Gottfried Wilhelm von Leibniz (1646–1716) is regarded as the first German thinker of European stature of the modern period. His thoughts as he presented them to the ‘Theodizee’ have become an important feature of the Enlightenment. The English poet, Alexander Pope (1688–1744), was an important influence on the ideology of the Enlightenment with his ‘Essay on Man’ (1733), in which he sought to discover the origin of evil and its compatibility with a benevolent god.
- <sup>44</sup> Breidert 1994, 53.
- <sup>45</sup> Beat Ludwig May (1692–1758) to Haller, 2.1.1756: ‘... Que faut yl O Mortel? Mortel, Il faut souffrir, / Se soumettre en silence, adorer et mourir.’ (Besterman 1957–1958, XXIX, 9/10, cf. Breidert 1994, 71 and 213); cf. Roulet 1950, 78–84.
- <sup>46</sup> ‘Lorsqu’au petit Courbaux tu done sa pitance, / Ne pourray je espérer pour moi ton Assistance? / Ce Dieu sy grand, pour moi, peut yl être petit? / Non qu’il ne m’entre rien de pareil dans l’esprit. / Pardone O Dieu puissant. Sy ma route est obscure. Par une vive foi je puis la rendre sûre.’ (cf. Haller 1777 [1734], 198; cf. Stäuble 1953, 171).
- <sup>47</sup> Voltaire to Bertrand, 28.2.1756: ‘Eh bien! il n’y a qu’à ajouter le mot d’espérer à celui d’adorer, et mettre ‘mortels, il faut souffrir, / Se soumettre, adorer, espérer, et mourir.’ (Besterman 1957–1958, XXIX, 72).
- <sup>48</sup> Gabriel Seigneux de Correvon (1695–1775) to Haller, 27.3.1756 (Besterman 1957–1958, XXIX, 139).
- <sup>49</sup> ‘Un jour tout sera bien; voilà notre Espérance / Tout est bien aujourd’hui; voilà l’Illusion.’ (Breidert 1994, 72).
- <sup>50</sup> ‘Un jour tout sera bien: quelle frele espérance!’ (Havens 1929, 492).
- <sup>51</sup> Seigneux de Correvon to Haller, 27.3.1756: ‘Je n’entreprendrai point de vous rendre toutes les belles choses qu’il nous dit à la gloire du Christianisme; il les dit avec une chaleur qui persuade ...’ (Besterman 1957–1958, XXIX, 139); Jean-Alphonse Rosset de Rochefort (1709–1766).

<sup>52</sup> cf. Roulet 1950, 82.

<sup>53</sup> Haller to Bonnet, 8.1.1757: 'Tous ces Portugais devoient mourir; envie-t-on a DIEU leur createur le privilege de diriger leur mort un peu plus tot ou plus tard?' (Sonntag 1983, 93).

<sup>54</sup> Bonnet to Haller, 18.12.1756: 'Mais voilà Mr. Voltaire; il veut toujours manier le Philosophique, et presque toujours il le manie mal.' (ibid., 91).

<sup>55</sup> Bonnet to Haller, 27.3.1759: 'C'est à mon avis un des Etres les plus malheureux qui soyent sur la surface du Globe. Il le seroit désja par sa triste incrédulité. Un homme qui peint l'Univers, comme il est peint dans le Poëme sur Lisbonne et dans Candide, voit toute la Nature tendue de noir. Mais ce que je ne lui pardonne pas, c'est de nous la montrer ainsi.' (ibid., 161).

<sup>56</sup> Haller to Bonnet, 16.3.1759: 'J'ai reconnu a l'occasion de la ruine de Lisbonne les vues de ce Poete: Le mal domine, un Dieu bon et sage ne gouverne donc pas.' (ibid., 159); cf. *Göttingische Gelehrte Anzeigen* 8.12.1759 (1287).

<sup>57</sup> Cf. Stuber, *Paternalism* (forthcoming).

<sup>58</sup> Ibid.

<sup>59</sup> Cf. Stuber and Hächler 2000, 174–8.

<sup>60</sup> Löffler 1999, 28.

<sup>61</sup> Haller to Bonnet, 24.3.1760 (Sonntag 1983, 196); Bonnet to Haller 1.4.1760 (ibid., 198).

<sup>62</sup> Haller to Bonnet, 27.8.1762 (Sonntag 1983, 297).

<sup>63</sup> Tissot to Haller, 22.8.1764 (Hintzsche 1977, 189); Haller to Tissot, 7.9.1764 (ibid., 190); Horace-Bénédict de Saussure (1740–1799) to Haller, 21.8.1764 (Sonntag 1990, 193); Haller to Saussure 27.8.1764 (ibid., 194).

<sup>64</sup> Emanuel Hartmann (1722–1786) to Haller 26.2.1763.

<sup>65</sup> Johann Franz Samuel Knecht (1716–1771) to Haller, 6.11.1765; 13.11.1765; 23.12.1765 ('Beilage').

<sup>66</sup> Haller to Gemmingen, 6.12.1776 (Fischer 1899/1979, 107–9): 'Der Sturm hat in Holland grossen Schaden an Menschen und Vieh gethan ... Doch hat Amsterdam nicht gelitten, wohl aber die Demme, und beide Friesslande.'; Gemmingen to Haller, 28.7.1777 (ibid., 124–5).

<sup>67</sup> Bonnet to Haller 7.8.1764 (Sonntag 1983, 386–7); Haller to Bonnet 17.8.1764 (Sonntag 1983, 387–8); Haller to Bonnet 4.6.1769 (ibid., 822–3); Bonnet to Haller 25.5.1769 (ibid., 821). For the discussion of different theories of Noah's flood in early modern times see the article of Michael Kempe in this volume.

<sup>68</sup> Haller to Bonnet, 23.3.1764: 'CELUI qui calcula la durée du Monde, qui envoya en 1656 le deluge et jugeat la terre en commise; qui en 4000 unit la nature divine au plus pur des hommes, sait ce qu'il faut 6000, et ce qu'il faudra dans un million d'années pour rapeller les hommes a LUI rendre hommage. De grandes calamités, quelques hommes éclairés et respectables, mille autres moyens sont a sa disposition; les V[oltaire], les R[ousseau], les philosophes de nos jours ne sont que des enfans, qui soufflent contre une tempeste. La tolerance etendra la lecture de l'unique livre, que ecrase la superstition d'un coté, et l'atheisme de l'autre. En un mot, Craignons Dieu cher abner, n'ayons point d'autre crainte.' (Sonntag 1983, 372).

<sup>69</sup> Cf. Stuber 1997, 204–9; Pfister and Brändli 1999.

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