contributions that make up this volume within a shared research programme, revolving around the two points I have mentioned above; she explains how they individually contribute to it, and moreover manages to cast that same research programme into the future, by laying out further avenues for exploration and not shying away from the political import of what academic research can tell us about knowledge, objectivity and the construction of cultural identity. Overall, this volume is a milestone – the history of ancient mathematics has its very own French revolution, and it has finally crossed the Channel.

SERAFINA CUOMO
Birkbeck, University of London

MARCO BERETTA, FRANCESCO CITTI and LUCIA PASETTI (eds.), **Seneca e le Scienze Naturali**. Florence: Leo S. Olschki Editore, 2012. Pp vi + 273. ISBN 978-8822-261982. €29.00 (paperback).
doi:10.1017/S0007087413000460

In November 2008, a group of researchers from different fields met in Ravenna, Italy. This volume contains a collection of the essays – in Italian, English and German – proceeding from that meeting. The great challenge of the book lies in its interdisciplinary character: Seneca's scientific work *Naturales Quaestiones* has been treated not only by philologists, but also by scholars from other fields. However, one does not know the authors' educational background – which can be considered at the same time as a merit and as a deficiency of the book.

Marco Beretta explores Seneca's concept of natural law, in relation to the Epicurean idea of a natural legacy. In the first part of his essay, the author presents a short doxography dealing with the different ways the idea of natural law had been conceived before Seneca. Whereas some ancient philosophers thought of it in terms either of habits ('what usually happens in nature') or harmony ('normal functioning of the body'), Stoics rather conceived it within a providentialist view of nature. This attitude contributed to linking natural phenomena with their prime cause; that is, the divine law (p. 5). Thus, in the strong Stoic view, natural laws, as they imply necessity, are inexorable. Seneca's idea of natural lawfulness is indeed consistent with Stoics' view, but Beretta states that the ancient philosopher would likely have read Lucretius, for his providentialism and finalism are not so strong as in other Stoic scholars. In fact, Lucretius rejected astrology as a scientific tool of inquiry, even though this was implied in Stoicism. Thus Seneca's conception of natural lawfulness seems close to the idea of natural law in classical mechanics for its main characters: universality and invariance.

Piergiorgio Parroni analyses Seneca's dramatic language as a scientist. Since the aim of Stoic science is to turn humans into better persons, *Naturales Quaestiones* displays a peculiar style, which is not far from Seneca's moral works and deeply pathetic. Knowledge of natural phenomena is urged, then, mainly because they can affect mankind – as, for example, is the case with earthquakes. Thus the context of fear of death amplifies the dramatic emphasis of scientific knowledge. The imaginative power of allusions is required to emphasize a scientific statement, as it deprives it of its bleak theoretical features by charging it with the pathos that makes science and humanities meet (p. 29).

Harry Hine questions Seneca's originality and independence in scientific matters and states that the ancient writer was indeed a creative philosophical thinker, as he 'gives a distinctive and probably novel Roman stamp to his philosophizing' (p. 32). This novelty is inferred by the author from the fact that Seneca does not generally translate Greek terms, but he is rather interested in the history of Latin terminology of the meteorological phenomena he is writing about.

Francesca Romana Berno focuses on the theory of the four elements, as it has been treated in *Naturales Quaestiones* Book 3. More specifically, in that passage Seneca exploits the idea of the transformation of elements. Water is not going to run out, nor can it be produced: each element is

potentially capable of transforming itself in all the others, provided the overall cosmic balance is maintained. This theoretical exposition of Seneca's serves as an explanation of the universal flood.

Pasquale Rossi's paper deals with Seneca's study of the Nile's flood and focuses on the philosopher's attitude in analysing and then criticizing other authors' views. What is of great interest in Seneca's work is the fact that he does not suggest an explanation to the problem; thus he provides an enlightening example of the scientific process: although one is not able to give a solution, a critique of ancient theories is needed to make research advance. On the same subject, Daniele Pellacani provides an up-to-date bibliography.

Arturo De Vivo treats the topic of earthquakes in *Naturales Quaestiones*. Seneca encounters this theoretical issue because of his personal experience of an earthquake in Campania, in 62 AD. Scientific inquiry is, then, needed in order to stave off fear. By suggesting his hypothesis (that is, earthquakes were caused by subterranean air), Seneca's narrative style resembles a tale, and represents a historiographical format which is not usual in scientific works.

Francesco Citti recalls Seneca's *De otio* in order to show why, according to the author, research on natural sciences is demanded: it is the most praiseworthy way to reach *res publica maior*, rather than taking part in political life. Hiro Harai shows how Justus Lipsius used Seneca's *Naturales Quaestiones* to make Stoicism compatible with Christian theology. Bardo Maria Gauly's contribution to the volume deals with Seneca's studies on comets. The fortunes of *Naturales Quaestiones* throughout different ages have been exploited by Fabio Nanni and Daniele Pellacani: Seneca's thought seems to be of interest even for Michel Foucault and Georg Cantor.

The papers included in this book represent a rich contribution to research on the history of science dealing with Roman antiquity. Moreover, they are all of high quality and remedy a remarkable poverty in the literature on Seneca's scientific work.

Federica Turriziani Colonna
Arizona State University

José Chabás and Bernard R. Goldstein, **A Survey of European Astronomical Tables in the Late Middle Ages**. Leiden: Brill, 2012. Pp. xix + 250. ISBN 978-90-04-23058-3. €107.00 (hardback).
doi:10.1017/S0007087413000472

Astronomical tables abounded in late medieval Europe. They survive in hundreds of manuscripts, testifying to their theoretical interest for scholars and, especially, to their practical utility. Their proliferation stemmed from tremendous consolidation efforts undertaken for Alfonso X of Castile (1221–1284), but they depended for their underlying theory and observational data on centuries-old work, most notably that of Ptolemy. This 'Greek' tradition was filtered through centuries of Arabic-language scholarship, whose most significant contributor was al-Battānī (d. 929); alongside it ran a parallel and eventually cross-fertilizing 'Indian' tradition, represented by al-Khwārizmī (fl. 830) and his successors. In addition, a flourishing strain of astronomy in Hebrew, exemplified by Levi ben Gerson (d. 1344), should be mentioned. In the early fourteenth century the work of the Alfonsine astronomers underwent considerable study and modification in Paris; this led to the dissemination of Alfonsine tables, largely in Latin, across western Christendom.

This dissemination of astronomical knowledge is a fascinating story, which is still in the early stages of reconstruction; the tables themselves provide essential evidence in mapping the transit of knowledge. However, so far they have largely been studied as individual manuscripts or, at best, as strands within the wider tradition. Exceptional in this regard are the articles by E.S. Kennedy – 'A survey of Islamic astronomical tables', *Transactions of the American Philosophical Society* 46 (1956), pp. 123–177 – and by David A. King and Julio Samsó, with Bernard R. Goldstein – 'Astronomical handbooks and tables from the Islamic World (750–1900): an interim report, *Suhayl* 2 (2001), pp. 9–105. But such work has not hitherto been undertaken on Western manuscripts.