Editorial

The fifth volume of *SCIAMVS* presents a wider range of original texts than any of the preceding issues. The first article deals with some of the earliest mathematical writings in Western culture: those written on clay tablets belonging to the Old and Neo-Babylonian periods (ca. 1800–1600 and 626–539 B.C.E. respectively). The second reconstructs a mathematical text by Archimedes of Syracuse (287–212 B.C.E.), whose work is usually considered as the culmination of the Greek geometrical tradition, but who was also a pioneer in many other fields of science and mathematics, as further argued in the article published here. The third reveals the richness of Arabic mathematics, in the construction of portable astronomical instruments in the thirteenth century. The mantle of mathematics had passed from the Greeks to the Arabs in the ninth century, on the very soil in which Babylonian scholarship had flourished, but Arabic mathematicians had a marvellous talent for invention and refinement, which is demonstrated not least by the variety and subtlety of the astronomical instruments that they described and constructed. The glorious march of progress in mathematics can be traced from the Babylonians through the Greeks to the Arabs. From this point onwards, however, the situation becomes more complex. The received opinion is that Western European scholars in the Middle Ages took the mantle from the Arabs by recovering through them Euclid's *Elements* and Ptolemy's *Almagest*, and taking over Arabic algebra, trigonometry and Indian (Arabic) numerals; after that, mathematics went from strength to strength in the West but languished in the East. Recent studies are revealing that, on the contrary, Arabic/Islamic mathematics continued to advance, not only through the observations made at the great observatories of Maragha and Samarkand, but also in cities throughout the Islamic realm. These advances, however, passed largely unnoticed in the West. Some planetary models by Naṣīr ad-Dīn at-Ṭūsī (d. 1274) and Ibn al-Šāṭir (d. 1375) appear to have been known to Copernicus, by routes which are still unclear, while, later, the tables of Ulugh Beg (Samarkand) were translated (Oxford, 1665) and three lost books of Apollonius's *Conics* were recovered from Arabic sources (eventually published in Latin in Oxford, 1710). But in general mathematics in the European and Islamic worlds flowed in separate channels. The last article in this volume gives an example of how tributaries from these channels have flowed together in more modern times. For India, on the far side of the Central Islamic realm, had absorbed, successively, Greek astronomy (after the conquests of Alexander the Great) and Islamic astronomy (especially in the Moghul period), while preserving ancient cosmological systems which had in turn influenced the West. In the nineteenth century there was pressure to adopt Western astronomical theories. But this was done not at the expense of the venerable Indian tradition: the medium was Sanskrit verse, and arguments from traditional Sanskrit *siddhāntas* were used as far as they were compatible with a heliocentric universe.

From Ancient Mesopotamia to nineteenth-century Benares there is a remarkable sense of continuity. In one of the Neo-Babylonian texts published below (n. 28) the earliest known example of a symbol for 'zero' is used. Greek astronomers also had such a symbol, which was used alongside roman numerals by early medieval Western astronomers. But the symbol that became most widely adopted was the one used by the Indians. It had passed into the Arabic world by the early ninth century and became familiar to Western scholars in the twelfth. This symbol, together with the nine Indian numerals, was that used by the Europeans who collaborated with the Indian pandits in Benares in the mid-nineteenth century. The circle that represents 'nothing' had come full circle!

The four articles in this issue of *SCIAMVS*, therefore, in spite of their chronological diversity, form an integral whole. Eleanor Robson's article is a self-contained account of a single collection of mathematical cuneiform tablets, rather than a sequel to her article on the Philadelphia collection which appeared in *SCIAMVS* 1. The publication of Parts II and III of this article has had to be postponed out of consideration for work on a parallel collection in Istanbul which is currently being carried out by Christine Proust. It is unfortunate that a fifth article, on Byzantine astronomy, has been withdrawn from this Journal, but it is hoped that it will be published elsewhere.

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